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## Bedwetting and behavioural and/or emotional problems

RA Hirasing<sup>1</sup>, FJM van Leerdam<sup>2</sup>, LB Bolk-Bennink<sup>1</sup> and JD Bosch<sup>3</sup>

TNO Prevention and Health<sup>1</sup>, Leiden, Regional Health Authorities<sup>2</sup>, Hoorn, and Department of Developmental Psychology<sup>3</sup>, Free University, Amsterdam, The Netherlands

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**Objective:** To assess the link between enuresis nocturna and the severity of behavioural and/or emotional problems in Dutch children and the course of these problems. **Setting:** West-Mine Region in the Netherlands. **Subjects and methods:** Prospective cohort study involving 66 of the 80 bedwetting children from all 1652 children born in 1983 in this region. After 1 y, contact was still possible with 64 of the enuretics. We used the Dutch version of the Child Behaviour Checklist (CBCL) and a questionnaire about bedwetting. **Results:** The mean T-score for Total Problems (CBCL score) in 1992 (M1; mean age 8.6) was 52.1, and 1 y later was 49.2 (M2). There was no significant difference in the CBCL scores for M1, M2 and a matching group from the Dutch CBCL norm population, either in the group who remained wet or in the group who became dry. There were no differences between the sexes. There was no link between the severity of behavioural and emotional problems and the frequency of bedwetting. However, more children with bedwetting than expected were in the clinical range. **Conclusion:** There was no difference in behavioural and/or emotional problems between the first and the second measurement and the matching group from the CBCL norm group. There were no differences in behavioural and/or emotional problems between primary and secondary bedwetters, nor were there any consequences related to the frequency of bedwetting. □ *Behavioural and/or emotional problems, CBCL, enuresis nocturna*

RA Hirasing, TNO Prevention and Health, P.O. Box 2215, 2301 CE Leiden, The Netherlands

The possible relationship between bedwetting and behavioural and/or emotional problems has long been subject to contradictory statements from researchers and from the general public.

Some studies show a relationship between bedwetting and behavioural and/or emotional problems (1, 2). However, it is not clear if the behavioural problems are a cause or a consequence of bedwetting. Other authors suspect that children with secondary enuresis have more problems (3, 4). Sharf and Jennings (5) noted that psychological factors were often clearly visible in the development of secondary enuresis, and less clear in primary enuresis. According to them, in primary enuresis nocturna, emotional problems are often a consequence of parental reactions and rarely a cause.

Hallgren (6) studied a selected population of Swedish enuretic children referred to a paediatrician or psychiatrist. Forty percent of them were problem children, while only 15% of their siblings were problem children. Baker (7) found no difference in behaviour between bedwetters and a control group. As in the study of Wille (8), his population was also small and selected. In the only prospective study of behaviour in enuretic children, Moffatt (9) reported an improvement in behaviour in the treated group.

The preliminary conclusion is that the relationship between enuresis nocturna and deviant behavioural and/or emotional problems is not clear. This is the result of different study designs and low numbers of children. The

best indication that behavioural problems are a result of bedwetting is the improvement of behaviour after the child has become dry.

We therefore decided to initiate a prospective study on behavioural and emotional problems in bedwetting children.

The aim of this study was to assess the link between the pattern of enuresis nocturna and the severity of behavioural and emotional problems in Dutch children, and to establish the history of the problems.

### Subjects and methods

The study population consisted of all school-going children (1652 children: 843M and 809F) born in 1983 who live in the southeast of the Netherlands (Geleen and Sittard and region). Fifteen children attending a rehabilitation centre or a boarding school were excluded.

The Dutch norm population of the Child Behaviour Checklist (CBCL) was used as a matching group (mean T-score 50.2, SD 10.7) (10).

There were two measuring points: measurement one (M1) in 1992 and measurement two (M2) after 1 y. At M1 all children were asked if they had wet their bed during the past 4 weeks. If this was the case, the school doctor filled in a doctor's form, consisting of questions about frequency of bedwetting, duration of dry periods,

history and previous treatments used for bedwetting. After this examination, the parents received a letter with a folder about bedwetting, an explanation of the study, a parent's form, a CBCL questionnaire and a stamped addressed envelope.

The study was performed by six selected school doctors, instructed and trained for the purpose of the study. At M2, all the parents who completed the parent's form at M1 were interviewed by telephone and asked to fill in a new mailed CBCL questionnaire.

A criterion stated for secondary enuresis in the DSM-III-R (11) is period of continence of 1 y. Other sources in the literature follow a criterion of 6 months (12–14). We used both definitions in the statistical analysis.

The CBCL questionnaire was used to assess behavioural and emotional problems. The CBCL for children aged between 4 and 16 is a normed questionnaire (15, 16). We used the translated Dutch version (10, 17, 18).

We used only the T-score for the Total Problem Score of the CBCL (CBCL score.) This CBCL score consists of the score for all questions about behavioural and emotional problems and is a measure for the level of behavioural and/or emotional problems. The questionnaire consists of a competence and a problem scale, but only the latter was used in our study. It consists of 118 questions about behaviour/emotional problems. Parents are requested to circle a 0 if the item is not true of the child, a 1 if the item is somewhat or sometimes true of the child and a 2 if it is very true or often true. A Total Problem Score (CBCL score) is computed by adding up all zeros, ones and twos. The score ranges from 0 to 236. The CBCL score breaks down into a normal range ( $T < 63$ ) and a clinical range ( $T \geq 63$ , this is the 90th percentile of the score in the norm population), and can be compared with norm scores for different subpopulations for age and sex. A child in the clinical range is comparable to a child receiving mental health care for behavioural and/or emotional problems.

### Statistics

CBCL scores were tested at M1 and M2 with a paired sampled *t*-test appropriate for two consecutive measurements. Possible differences in the CBCL score between primary and secondary enuretics were tested in two ways (different definitions of enuresis) with a two-sided *t*-test. The link between frequency of bedwetting and the CBCL-scores was tested with a one-way analysis of variance. In other cases, a  $\chi^2$  test was used.

### Results

At M1, 80 children [52M (6.2%) and 28F (3.5%)] had enuresis nocturna. Of this group, 66 parents (83%) filled in the parent's form (47M and 19F). The average age was 8.6 y (SD 0.5). The group of non-respondents ( $n = 14$ ) did not differ significantly from the other children in terms of sex, frequency of bedwetting and wearing diapers at night.

In one case, we did receive the parent's form but not the CBCL questionnaire. The data on frequency and pattern of bedwetting at M1 have already been published (19). At M1, the bedwetting boys did not differ significantly from the girls in the level of behavioural and emotional problems [ $T(64) = -0.59$ ;  $p = 0.56$ ]. In addition, CBCL scores for children with primary vs secondary enuresis did not differ significantly at M1 (DSM-III-R criteria: [ $T(64) = 0.86$ ;  $p = 0.40$  and other criteria:  $T(64) = 0.26$ ;  $p = 0.80$ ].

There was no statistically significant difference between the mean CBCL score at M1 (52.1; SD 12; range 32–82; median 50) and the mean CBCL score for the matching group (50.2) [ $T(130) = -1.23$ ;  $p = 0.22$ ].

At M2, 64 of the 66 parents of M1 responded. The response rate was therefore 80%. The mean CBCL score at M2 was 49.2 (SD 12; range 9–78; median 49). The difference between M2 and the matching group is not statistically significant.

The number of bedwetting children ( $n = 15$ ) found in the clinical range was, however, higher than expected (in the norm population 10% in the clinical range) in both measurements (Table 1).

At M2, six children (one dry and five wet) moved from the clinical range to the normal range (Fig. 1).

In both measurements, there was no link between the frequency of bedwetting and the CBCL score.

There was no statistically significant drop in the CBCL score, either in the group that became dry or in the group that remained wet. Of the 15 children in the clinical range at M1, 4 became dry. In one case, the mean CBCL score improved to normal at M2. Ten children remained bedwetters and in 5 cases the CBCL score improved to normal. Of the 50 children in the normal range at M1, 17 became dry. One of them passed from the normal range to the clinical range. Thirty-three children remained wet, 2 of them passed to the clinical range (Fig. 1).

### Discussion

Of all 1667 children born in 1983 in the West-Mine Region in the Netherlands, only 15 could not be included in this survey. Measured in accordance with the DSM-III-R criteria (11), the prevalence of enuresis nocturna was 4.8% (6.2% for the boys and 3.5% for the girls). This corresponds to other findings in the literature (20, 21).

We used the Child Behaviour Checklist (18) to investi-

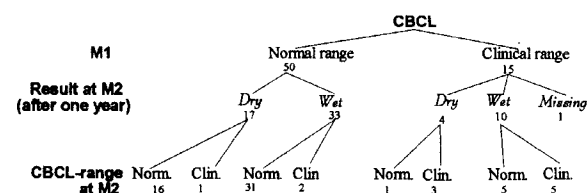


Fig. 1. Number of children by CBCL range at measurement 1 (M1) and 1 y later (M2).

Table 1. Number and percentage of children (mean age 8.6 y) with a CBCL score in the normal or clinical range at measurement one (M1) and 1 y later (M2).

CBCL range	n (wet children)		n (wet and dry children) M2	
	M1	(%)	M2	(%)
Normal	50	76	53	80
Clinical	15	23	11	17
Missing	1	2	2	3

gate the level of problems in the enuretics and followed them prospectively.

We concluded that the frequency of bedwetting was not related to the behavioural and/or emotional problems of bedwetters. This is in agreement with the findings of Rutter (2).

We found no significant difference between primary and secondary bedwetters in the level of behavioural and/or emotional problems. Järvelin et al. (4) investigated the characteristics of secondary enuresis. They noted that separation from one of the parents increases the risk of enuresis nocturna. They found more life events in the year before the secondary enuresis. Other authors found no significant differences in frequency and degree of behavioural disturbances between primary and secondary enuretics (2, 12).

The mean CBCL score at M1 and M2 was not statistically different from the norm T-score for the matching group.

This suggests that there is no difference in behavioural and/or emotional problems between the norm population and the bedwetters. However, the number of children found in the clinical range was higher than expected in both measurements. This means that, in addition to more children in the clinical range, there must also be more children than expected with a CBCL score much lower than the mean. This indicates that the group of children with enuresis nocturna consists of children with behavioural and/or emotional problems in a clinical range and of children with very few problems. Therefore, enuresis nocturna is not synonymous with behavioural and/or emotional problems. If it is suspected that there are behavioural and/or emotional problems in an enuretic child, this has to be checked systematically (for example with the CBCL questionnaire).

An interesting result of our study is that there was no difference in the number of children with behavioural and/or emotional problems in the groups of patients who were still wet at M2 and those who became dry. Our study shows that enuretic children with behavioural and/or emotional problems in the clinical range can also become dry. It is not necessary to treat the behavioural and/or emotional problems first. On the contrary, treating the bedwetting is a concrete activity which, if handled well, could lead to trust in the care provider. If the problems persist after the child has become dry, the achieved trust in the care provider is a good basis for also treating the behavioural and/or emotional problems.

A limitation of our study was that it was part of a larger study concerning many other aspects of enuresis. We could therefore only note the presence or absence of behavioural and/or emotional problems and could not study these problems in detail using all the syndrome scales of the CBCL. The results, however, should be taken cautiously because of the low power of the study on some occasions. Although the total sample was large enough, the number of children with nocturnal enuresis and the number of children in the subgroups, was relatively small.

## Conclusion

In our study, no difference in the behavioural and/or emotional problems (CBCL score) could be found between M1 and the matching group from the CBCL norm group of the CBCL, M2 and the matching group or M1 and M2. However, more bedwetting children than expected were in the clinical range at both M1 and M2.

There were also no differences in behavioural and/or emotional problems between children with primary enuresis and children with secondary enuresis, nor had the frequency of bedwetting any consequences for the level of behavioural and/or emotional problems.

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## Announcements

Nominations for **The Arnold-Lucius Gesell Prize**, awarded every two years for outstanding scientific achievement in the fields of child behaviour and the development of language, should be made before 1 November 1997 to the Office of the Theodor-Hellbrügge Foundation, German Academy for Development Rehabilitation, Heighhofstr 63, D-81377 Munich, Germany.

**1st National Symposium on Angelman Syndrome** will be held in Brussels, Belgium on 29 November 1997. Deadline for submission of Abstracts 15 September 1997. Further information may be obtained on request from: Dr B. Dan, 147 Avenue du Parc, 1190 Brussels, Belgium. Fax: +32 2 477 3287.

**8th International Symposium on Viral Hepatitis** will be held in Madrid, Spain on 22-24 January 1998. Organized by Fundación para el Estudio de las Hepatitis Virales, Madrid, Spain, topics will include pathogenesis and molecular biology of hepatitis B, C, D, E and G viruses and antiviral therapy of chronic viral hepatitis. Deadline for receipt of Abstracts is 10 December 1997. Further information may be obtained from Dr Inmaculada Castillo, Department of Hepatology, Fundación Jiménez Díaz, Avda. Reyes Católicos 2, E-28040 Madrid, Spain. Tel: +34 1 543 19 64. Fax: +34 1 544 92 28.

**International Conference on Paediatric Asthma, a Masterclass Symposium**, will take place at the Maastricht Exhibition and Conference Centre, The Netherlands on 3-4 March 1998. A preliminary programme may be obtained on request to: Castle House Conferences, 3 Linden Close, Tunbridge Wells, Kent TN4 8HH, England. Tel: +44 (0)1892 539 606. Fax: +44 (0)1892 517 773/517 005.

**European Consensus Development Conference (ECDC) on Neonatal Hearing Screening** will be held in Milan, Italy

on 15 and 16 May 1998. Further information may be obtained from Dr F. Grandori, Centre of Biomedical Engineering, Polytechnic of Milan, Piazza Leonardo da Vinci 32, I-20133 Milan, Italy. Fax: +39 2 2399 3360. Email: ecd-c@elet.polimi.it.

**3rd International Symposium on Paediatric Dermatology** will be held in Rome, Italy on 10-12 September 1998. The symposium will be organised by the International Centre for Study and Research on Dermatology, the Department of Dermatology of the Catholic University of the Sacred Heart and the Italian Group of Paediatric Dermatology (GIDEP). Simultaneous translations of all sessions will be provided in Italian, English and French. Further details may be obtained from Prof. G. Fabrizi, Department of Dermatology, Catholic University of the Sacred Heart, Largo A. Gemelli 8, 00168 Rome, Italy. Tel/Fax: +39 6 3013250.

**8th International Child Neurology Congress** will be held in Ljubljana, Slovenia on 13-17 September 1998. For information, please contact Milivoj Velickovic Perat at the Cankarjev dom Cultural and Congress Centre or, alternatively, please look up web page: <http://www2.mf.uni-lj.si/velickovic/icna.htm>.

**6th Congress of European Society for Pediatric Dermatology** will be held in Rome, Italy on 14-18 September 1999. The symposium will be organised by the International Centre for Study and Research on Dermatology, the Department of Dermatology of the Catholic University of the Sacred Heart. Simultaneous translations of all sessions will be provided in Italian, English and French. Further details may be obtained from Prof. G. Fabrizi, Department of Dermatology, Catholic University of the Sacred Heart, Largo A. Gemelli 8, 00168 Rome, Italy. Tel/Fax: +39 6 3013250.